

REMARKS

This Amendment is in response to the Office Action mailed August 15, 2001. Claims 1-15 and 21 are pending in the application and claims 16-20 were cancelled pursuant to an election requirement. Claims 1-15 and 21 have been rejected and Applicants respond to the rejection of claims 1-15 and 21 as follows.

Response to claim rejections - 35 U.S.C. § 112

Claims 1-15 were rejected under 35 U.S.C. § 112, Second Paragraph, as being indefinite on the basis of the terms "adapted to" and "for unloading". The rejection of claims 1-15 on the basis of the terms "adapted to" and "for unloading" is improper since use of such terms or functional language in a claim does not render the claim indefinite. (See M.P.E.P. § 2173.05(g)). Although Applicants' use of the recited terms is proper, claims 1-15, as amended, do not recite the terms "adapted to" or "for unloading". Based upon the foregoing, Applicants respectfully request withdrawal of the rejection of claims 1-15 under 35 U.S.C. § 112, Second Paragraph.

Response to claim rejections - 35 U.S.C. § 102

Claim 21 was rejected under 35 U.S.C. § 102(b) as being clearly anticipated by U.S. Patent No. 4,481,751 to Sabel. Claim 21 has been amended to recite *inter alia* means for intermittently stocking the apparatus with a supply of components for assembly. Pursuant to 35 U.S.C. § 112, means-plus-function language in a claim must be interpreted in light of the corresponding structure or elements disclosed in the specification and equivalents thereof. See *In Re: Donaldson* 29 U.S.P.Q.2d 1845 (Fed. Cir. 1994). Applicants' application discloses means for stocking the apparatus for continued assembly to reduce delay and to increase production capacity in respond to higher production demands.

As described in Applicants' specification, in one embodiment assembly components (namely discs and spacers) are stored on carousels 154, 158-1 and 158-2 which are removably coupled to the apparatus so that the carousel(s) can be removed to be stocked and/or replaced with a carousel with a full supply of components to continue assembly without increased production delay. (Applicants' specification, Page 19, lines 18-23). Also as described, in one embodiment disc carousels removably support disc magazines or containers so that the disc magazines or containers can be loaded on the carousel directly without separately unpacking and loading each disc for assembly. This reduces operator handling and expense. (Applicants' specification, Page 9, lines 27-33).

None of the structure or embodiments disclosed in Applicants' specification corresponding to the recited means as discussed is taught nor suggested by Sabel. The removable features provides advantages over prior component carousels and is not taught nor suggested by Sabel. Sabel does not teach nor suggest the corresponding structure to the recited means nor does the Office Action establish that the structure taught by Sabel is equivalent to the recited structure pursuant to the Supplemental Examination Guidelines of June 21, 2000. Accordingly, reconsideration and allowance of claim 21 are respectfully requested.

Claims 1, 2 and 5-7 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,987,735 to Horning. Horning was filed subsequent to the priority date of February 25, 1998 of Applicants' provisional application which teaches novel aspects of Applicants' invention. Additionally, claims 1, 2, 5 and 7 as amended, recite inter alia a carousel coupling device to removably couple a component carousel to the carousel base which is not taught nor suggested by the cited reference. The carousel coupling device as recited allows

carousels to be removed to load or to restock the carousel with components as previously discussed which is not taught nor suggested by the cited reference.

Claim 5 further recites a carousel including a plurality of latch assemblies to removably secure a plurality of component containers at spaced locations. As previously discussed, pre-packaged cassettes or containers can be loaded onto the carousel without handling individual components or stacking individual components to simplify the assembly process which is not taught by the cited references. Based upon the foregoing, reconsideration and allowance of claims 1, 2 and 5-7 are respectfully requested.

Response to claim rejections 35 U.S.C. § 103

Claims 3-6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horning in view of U.S. Patent No. 5,077,888 to Tokisue. Tokisue teaches a vacuum gripper on arm or positioning mechanism 3 for picking up an article 1 for assembly. Claims 3-6 are dependent upon claim 1 which as previously discussed, recites *inter alia* a removable coupling assembly for a component carousel. Neither Horning nor Tokisue ~~discloses a removable carousel assembly~~ as described. Tokisue teaches a gripper on an arm and does not teach nor suggest a removable coupling device as recited to support components for assembly by an arm.

Claims 4-6 further recite subject matter which is patentable over the recited references. Claim 5 recites subject matter which is allowable over Horning as previously discussed and is also allowable over Tokisue. Claim 6 further recites a plurality of carousel bases and an assembly arm driver which operates the assembly arm between multiple component carousels on the plurality of carousel bases so that the assembly arm can switch between carousels to limit interruption in the assembly operation as described in Applicants' specification which is not

taught nor suggested by the cited references. Based upon the foregoing, the combination of Horning and Tokisue does not teach nor suggest the subject matter of claims 4-6.

Claims 6-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horning. Claims 6-10 are dependent upon amended claim 1 and further recite features of Applicants' invention and are allowable over Horning as previously discussed. In addition, claim 8 recites a carousel with a plurality of latch assemblies to removably couple component cartridges or containers to the apparatus and claim 9 recites a cover detacher for containers supported by the latch assemblies of claim 8. As previously discussed, the subject matter of claim 1 is not taught nor suggested by Horning nor is the further subject matter of claims 6-10. Accordingly, reconsideration and allowance of claims 6-10 over Horning are respectfully requested.

Claims 11-15 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Horning in view of U.S. Patent No. 4,481,752 to Sabel. Claims 11-15 are dependent upon claim 1 which as previously discussed, is not taught nor suggested by Horning nor the further combination of Sabel. Claim 12 further recites a plurality of spaced latch assemblies to removably couple a plurality of disc containers to a disc carousel which is not taught nor suggested by the combination of Horning and Sabel as previously discussed.


Claim 21 as previously discussed is allowable over Sabel and as properly interpreted under 35 U.S.C. §112 as previously discussed is allowable over the combination of Sabel and Horning. Based upon the foregoing, reconsideration and allowance of claims 11-15 and 21 are respectfully requested.

New claims 22-26 are added for consideration. Favorable action with respect to new claims 22-26 is respectfully requested.

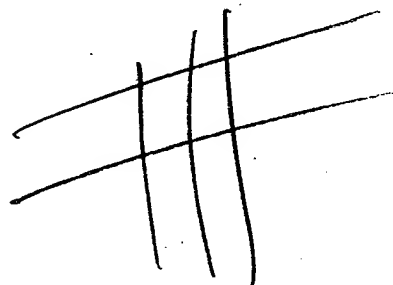
The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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MARKED-UP VERSION OF REPLACEMENT CLAIMS

1. (Twice Amended) An apparatus for assembling components of a data storage device comprising:

a frame;

a carousel base rotationally coupled to the frame and
~~adapted to removably support a component carousel~~

a carousel coupling device to removably couple a
component carousel including a plurality of
assembly components to the carousel base;

an assembly arm movably coupled to the frame; and

~~operable~~ a driver coupled to the assembly arm to move the assembly
arm between the carousel base and an unassembled
data storage device, to sequentially unloading
individual components from the carousel and
assembling assemble the unloaded components into
the data storage device.

2. (Twice Amended) The apparatus of claim 1 wherein the carousel supports a plurality of stacks of components at spaced locations arranged about a center point and the apparatus comprises:

a motor coupled to the carousel base to
~~sequentially~~ rotationally positioning each stack of
components for assembly.

3. (Twice Amended) The apparatus of claim 2 ~~further~~
~~comprising~~ wherein the carousel coupling device comprises a vacuum
source, operably coupled to the rotatable carousel base, to supply
a vacuum pressure in an engaged mode to secure the carousel to the
carousel base and to release the vacuum pressure to
removably remove ~~secure the carousel to the rotatable carousel~~
base.

4. (Twice Amended) The apparatus of claim 2 further comprising an indexer coupled to the carousel base to align individual components from a the plurality of ~~stack~~stacks of components relative to the assembly arm.

5. (Twice Amended) The apparatus of claim 2 and including a carousel coupled to the carousel base ~~having a center point and individual~~ a plurality of elongated components in a component stack ~~are supported in an elongated container configured to contain a~~ plurality of components and the carousel includes a ~~latch assembly~~ plurality of latch assemblies to removably secure ~~at the~~ plurality of containers at spaced locations about ~~the center point of the carousel aligned with a rotation axis of the carousel base.~~

6. (Twice Amended) The apparatus of claim 1 wherein the apparatus includes a plurality of carousel bases rotationally coupled to the frame to support multiple component carousels and ~~the driver moves the assembly arm being operable between the~~ multiple component carousels on the plurality of carousel bases to unload the multiple carousels on the plurality of carousel bases and ~~operable to detect when one of the component carousels is empty and shift the assembly arm to another carousel.~~

7. (Twice Amended) The apparatus of claim 1 and further comprising a disc carousel removably coupled to the carousel base ~~wherein the component carousel is adapted to support discs for~~ assembly in a spindle motor of a data storage device.

8. (Twice Amended) The apparatus of claim 7 wherein the ~~component disc~~ disc carousel includes a plurality of spaced latch assemblies about a circumference of the disc carousel ~~and adapted to removably connect a plurality of disc containers storing a~~

plurality of stacked discs to the disc carousel at concentric spaced locations.

Claim 9 remains unchanged.

10. (Twice Amended) The apparatus of claim 1 wherein ~~the component carousel is~~ and further comprising a spacer carousel adapted to support spacers for assembly in a spindle motor of a data storage device.

11. (Twice Amended) The apparatus of claim 1 wherein the apparatus is adapted to assembly components of a disc stack supported by a spindle motor and further comprising:

- a plurality of carousel bases including a carousel base adapted to support a component carousel for discs and a carousel base adapted to support a component carousel for spacers;

- a plurality of assembly arms including an assembly arm coupled to the carousel base supporting the component carousel for discs for assembling to assemble the discs and an assembly arm coupled to the carousel base supporting the component carousel for spacers for assembling to assemble the spacers; and

- a plurality of drivers coupled to the plurality of assembly arms to move the assembly arms between the carousel bases and a loading station; and

- a controller coupled to the drivers of the assembly arm to coordinate operation of the plurality of assembly arms to alternately assemble discs and spacers.

12. (Twice Amended) The apparatus of claim 11 wherein the component carousel for the discs includes a frame including a plurality of circumferentially spaced latch assemblies to removably couple a plurality of disc containers to the carousel.

13. (Twice Amended) The apparatus of claim 12 wherein the disc containers house a disc stack including a plurality of coaxially aligned discs and further comprises an indexer to incrementally position the carousel base ~~adapted to~~removably supporting the carousel for discs ~~for to~~sequentially positioning one of the plurality of disc containers to unload individual discs in the disc stack.

14. (Twice Amended) The apparatus of claim 11 wherein the component carousel for spacers includes a base including a plurality of spacer posts arranged about a center point and sized to support a plurality of stacked spacers and including a motor coupled to the carousel base adapted to ~~support~~move the carousel ~~for spacers to align sequential posts~~stacks of spacers for assembly.

15. (Twice Amended) The apparatus of claim 14 further comprising an index rod operably coupled to the component carousel for spacers to push the spacers toward~~towards~~ an extended end of the posts for assembly.

21. (Amended) An assembly apparatus comprising:

an assembly arms and assembly arm driver operably coupled to the assembly arm to operate the assembly arm between a component load position and a component install position to unload components from the apparatus and load components in the unassembled device; and

means for ~~storing a plurality of components~~ intermittently
stocking the apparatus with a supply of components
for assembly by the assembly arms.